IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

WSOU INVESTMENTS, LLC d/b/a BRAZOS LICENSING AND DEVELOPMENT, Plaintiff, v. ZTE CORPORATION, ZTE (USA) INC., AND ZTE (TX), INC. Defendants.	§ § § § § § § § § § §	CIVIL ACTION NO. 6:20-cv-254 **JURY TRIAL DEMANDED**

ORIGINAL COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff WSOU Investments, LLC d/b/a Brazos Licensing and Development ("Brazos" or "Plaintiff"), by and through its attorneys, files this Complaint for Patent Infringement against Defendants ZTE Corporation, ZTE (USA), Inc. and ZTE (TX), Inc. (collectively "ZTE" or "Defendants") and alleges:

NATURE OF THE ACTION

1. This is a civil action for patent infringement arising under the Patent Laws of the United States, 35 U.S.C. §§ 1, et seq., including §§ 271, 281, 284, and 285.

THE PARTIES

2. Brazos is a limited liability corporation organized and existing under the laws of Delaware, with its principal place of business at 605 Austin Ave, Ste 6, Waco, TX 76701.

3. On information and belief, Defendant Zhongxing Telecommunications Equipment (abbreviated as "ZTE") Corporation is a Chinese corporation that does business in Texas, directly or through intermediaries, with a principal place of business at ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen China.

4. On information and belief, Defendant ZTE (USA) Inc. is a New Jersey corporation that does business in Texas, directly or through intermediaries, with a principal place of business in business in Richardson, Texas.

5. On information and belief, Defendant ZTE (TX) Inc. is a Texas corporation that does business in Texas, directly or through intermediaries, with a principal place of business in business in Austin, Texas.

6. All of the Defendants operate under and identify with the trade name "ZTE." Each of the Defendants may be referred to individually as a "ZTE Defendant" and, collectively, Defendants may be referred to below as "ZTE" or as the "ZTE Defendants."

JURISDICTION AND VENUE

7. This is an action for patent infringement which arises under the Patent Laws of the United States, in particular, 35 U.S.C. §§271, 281, 284, and 285.

8. This Court has jurisdiction over the subject matter of this action under 28 U.S.C. §§ 1331 and 1338(a).

9. This Court has specific and general personal jurisdiction over each ZTE Defendant pursuant to due process and/or the Texas Long Arm Statute, because each ZTE Defendant has committed acts giving rise to this action within Texas and within this judicial district. The Court's exercise of jurisdiction over each ZTE Defendant would not offend traditional notions of fair play and substantial justice because ZTE has established minimum contacts with the forum. For example, on information and belief, ZTE Defendants have committed acts of infringement in this judicial district, by among other things, selling and offering for sale products that infringe the asserted patent, directly or through intermediaries, as alleged herein.

10. Venue in the Western District of Texas is proper pursuant to 28 U.S.C. §§1391 and/or 1400(b). The ZTE Defendants have committed acts of infringement and have places of businesses in this District and/or are foreign entities for purpose of §1391. As non-limiting examples, ZTE (TX) has maintained a place of business at 7000 N MO-PAC EXPRESSWAY 200 AUSTIN, TX 7873; and, ZTE (USA) has maintained a place of business at 6500 River Place Blvd., Austin, TX 78730. ZTE Corp publication also describes a "research-and-development center in Austin, Texas."[1]

COUNT ONE - INFRINGEMENT OF U.S. PATENT NO. 7,742,534

11. Brazos re-alleges and incorporates by reference the preceding paragraphs of this Complaint.

12. On June 22, 2010, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,742,534 ("the '534 Patent"), entitled "METHOD FOR TRANSMITTING USER DATA IN A MULTI-CARRIERR RADIO COMMUNICATION SYSTEM, AND CORRESPONDING RECEIVER." A true and correct copy of the '534 Patent is attached as Exhibit A to this Complaint.

13. Brazos is the owner of all rights, title, and interest in and to the '534 Patent, including the right to assert all causes of action arising under the '534 Patent and the right to any remedies for the infringement of the '534 Patent.

14. ZTE makes, uses, sells, offers for sale, imports, and/or distributes in the United States, including within this judicial district, products such as, but not limited to ZTE products supporting LTE including but not limited to ZTE network elements such as Base Stations including but not limited ZXSDR BS8700, BS8800 and BS8906 and ZTE LTE

[1] https://res-www.zte.com.cn/mediares/magazine/publication/tech_en/pdf/201009.pdf

smartphones (e.g. ZTE Blade 10, ZTE Axon 10 Pro, etc.) (collectively, the "Accused Products").

15. The Accused Products include ZTE network elements such as Base Stations including but not limited ZXSDR BS8700, BS8800 and BS8906 and ZTE LTE smartphones (e.g. ZTE Blade 10, ZTE Axon 10 Pro, etc.).

16. ZTE has deployed commercial LTE networks and built LTE trial networks for telecom operators in North America.


ZTE has taken the lead in LTE development and has achieved significant breakthroughs in the industry. To date, the company has deployed five commercial LTE networks and built 40 LTE trial networks for leading telecom operators in Europe, North America, Asia-Pacific and MEA. With an aim to advance the telecommunications market into 4G technologies, ZTE will continue to drive innovation and introduce market-leading and cost-efficient solutions to the market.

https://www.zte.com.cn/global/about/news/350962.html

17. ZTE has opened an LTE testing laboratory in Richardson, Texas.

ZTE announced on October 20, 2009, that it has opened an LTE testing laboratory at its U.S. headquarters in Richardson, Texas. In the lab, ZTE will demonstrate and test its dual-mode CDMA/LTE platform, which enables carriers to lay the foundation for the delivery of LTE services in the U.S. Using the platform, ZTE can demonstrate an FTP downloading rate up to 52Mbps at 10MHz bandwidth and conduct CDMA voice service and LTE High Definition (HD) video demonstrations simultaneously.

ZTE's LTE platform currently employs the CDMA and LTE bands, which provides carriers with a smooth equipment migration path from CDMA to LTE while keeping infrastructure costs down. ZTE also has the capability to customize the platform for other bands according to the requirements of the carriers—in particular, ZTE can create a multi-mode GSM/UMTS/LTE platform.

In the lab, ZTE's team of local researchers will work closely with carriers to test and verify ZTE's CDMA/LTE platform to the highest industry standards in order to ensure that it is poised for successful commercial deployment. The lab is designed and has been built in accordance with international tier one operator test requirements, and is equipped to test several features including throughput, latency, coverage, velocity vs. data rate, traffic quality, mobility management and OMM/SON. On a global scale, ZTE has rich experience in field trials, including the Xi'an R&D institute.

This CDMA/LTE dual-mode laboratory is based on the Uni-RAN solution on ZTE unified Software Defined Radio (SDR) platform, and the lab is equipped with several sets of distributed eNodeBs including ZXSDR B8200 (BBU), ZXSDR R8880 (RRU), a set of ZXUN uMAC (MME), a set of ZXUN xGW (SAE-GW), a set of ZXUN USPP (HSS), a set of NetNumen M31 (OSS) and the latest commercial version software.

(ZTE Corporation)

http://www.zte-deutschland.de/pub/endata/magazine/ztetechnologies/2009year/no11/200912/P020091222462632602444.pdf

18. ZTE provides devices and products (e.g., base stations, etc.) with Long Term Evolution (LTE) capabilities. Some of these devices supporting LTE.

ZTE' s current LTE solution set consists of three base stations, the ZXSDR BS8700, BS8800 and BS8906. The BS8700 is a distributed base station consisting of a base band unit (BBU) B8200 and a remote radio unit (RRU) R8882. The BS8800 is a full sized integrated macro base station consisting of BBU B8200 and radio system unit RSU82. ZTE positions these two base stations as its high-capacity solutions. The BS8906, ZTE' s low-capacity LTE base station is a micro compact base station consisting of a BBU B8200 and RSU82. Both the BS8700 and BS8906 can scale with the addition of up to 17 RRUs.

https://www.zte.com.cn/global/about/magazine/zte-technologies/2010/11/en_515/194549.

19. ZTE provides LTE modules and mobile devices.

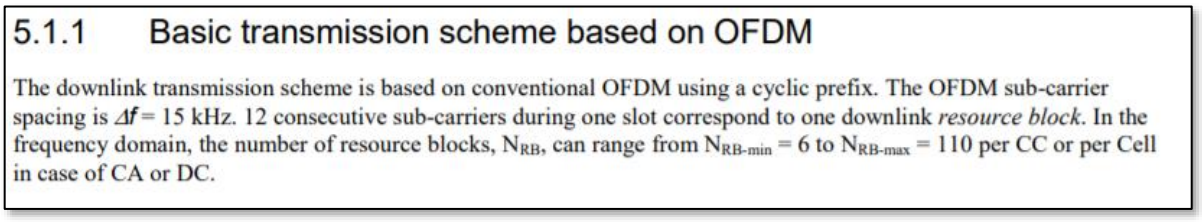
https://www.zteusa.com/products/m2m/zte-me3630,

Frequencies	LTE/UMTS/GSM/FDD/TDD
Modes	LTE 4*4MIMO B2/4/7/38/41/66 DL 4CA,DL 3CA,DL 2CA;UL 2CA UMTS:B1/2/4/5/8 GSM:B2/3/5/8 FDD:1/2/3/4/5/7/8/12/13/17/18/19/20/25/26/28/30/66/71 TDD:B34/38/39/40/41(2535-2655MHz)

https://www.zteusa.com/products/all-phones/axon-10-pro.html.

20. In LTE, the downlink transmission scheme for the physical layer is based on Orthogonal Frequency Division Multiplexing (OFDM) with a cyclic prefix (CP). Orthogonal Frequency Division Multiplexing (OFDM) is a multi-carrier transmission technique in which

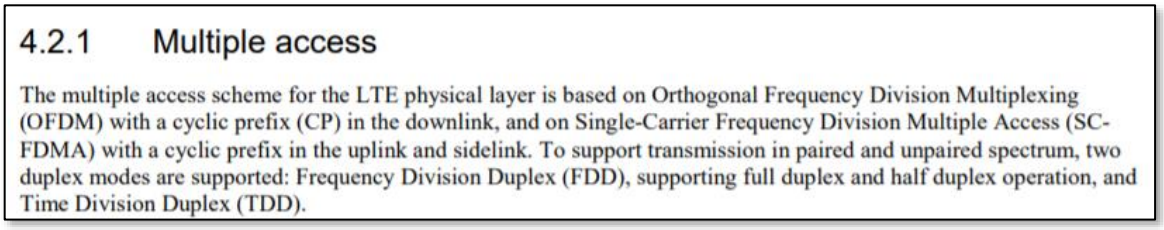
orthogonally spaced sub-carriers are used to transmit the information between transmitter (i.e., base station) and receiver (i.e., a mobile device or user equipment).



5.1.1 Basic transmission scheme based on OFDM

The downlink transmission scheme is based on conventional OFDM using a cyclic prefix. The OFDM sub-carrier spacing is $\Delta f = 15$ kHz. 12 consecutive sub-carriers during one slot correspond to one downlink *resource block*. In the frequency domain, the number of resource blocks, N_{RB}, can range from $N_{RB\text{-}min} = 6$ to $N_{RB\text{-}max} = 110$ per CC or per Cell in case of CA or DC.

https://www.etsi.org/deliver/etsi_ts/136300_136399/136300/15.08.00_60/ts_136300v150800p.pdf.



4.2.1 Multiple access

The multiple access scheme for the LTE physical layer is based on Orthogonal Frequency Division Multiplexing (OFDM) with a cyclic prefix (CP) in the downlink, and on Single-Carrier Frequency Division Multiple Access (SC-FDMA) with a cyclic prefix in the uplink and sidelink. To support transmission in paired and unpaired spectrum, two duplex modes are supported: Frequency Division Duplex (FDD), supporting full duplex and half duplex operation, and Time Division Duplex (TDD).

https://www.etsi.org/deliver/etsi_ts/136200_136299/136201/15.02.00_60/ts_136201v150200p.pdf.

21. In LTE networks, Channel Quality Indicator (CQI) reports are used to indicate the channel quality information. In CQI reporting, UE (i.e., receiver) measures the quality level of sub-carriers (i.e., determining at the receiver quality levels for sub-carriers) and reports it to eNodeB (i.e., transmitter). Channel Quality Indicator (CQI) reporting can be either periodic or aperiodic. In aperiodic CQI reporting, the eNodeB schedules the report on Physical downlink Control Channel (PDCCH), and UE sends the CQI report on Physical Uplink Shared Channel (PUSCH).

11.5 CQI reporting for Scheduling

The time and frequency resources used by the UE to report CQI are under the control of the eNB. CQI reporting can be either periodic or aperiodic. A UE can be configured to have both periodic and aperiodic reporting at the same time. In case both periodic and aperiodic reporting occurs in the same subframe for a particular CG, only the aperiodic report is transmitted in that subframe.

For efficient support of localized, distributed and MIMO transmissions, E-UTRA supports three types of CQI reporting:

- Wideband type: providing channel quality information of entire system bandwidth of the cell;
- Multi-band type: providing channel quality information of some subset(s) of system bandwidth of the cell;
- MIMO type: open loop or closed loop operation (with or without PMI feedback).

Periodic CQI reporting is defined by the following characteristics:

- When the UE is allocated PUSCH resources in a subframe where a periodic CQI report is configured to be sent, the periodic CQI report is transmitted together with uplink data on the PUSCH. Otherwise, the periodic CQI reports are sent on the PUCCH.

Aperiodic CQI reporting is defined by the following characteristics:

- The report is scheduled by the eNB via the PDCCH;
- Transmitted together with uplink data on PUSCH.

https://www.etsi.org/deliver/etsi_ts/136300_136399/136300/15.08.00_60/ts_136300v150800p.pdf.

7.2.1 Aperiodic CSI Reporting using PUSCH

A UE shall perform aperiodic CSI reporting using the PUSCH in subframe $n+k$ on serving cell c, upon decoding in subframe n either:

- an uplink DCI format, or
- a Random Access Response Grant,

Note: PDCCH with DCI formats used to grant PUSCH transmissions as given by DCI format 0 and DCI format 4 are herein referred to as uplink DCI format when common behaviour is addressed.

https://www.etsi.org/deliver/etsi_ts/136200_136299/136213/15.08.00_60/ts_136213v150800p.pdf.

22. In LTE networks, Channel Quality Indicator (CQI) (i.e., quality levels) reports are used to indicate the channel quality information. In CQI reporting, UE measures the quality level of sub-carriers and reports it to eNB (i.e., sending said quality levels from said receiver to said transmitter). Channel Quality Indicator (CQI) reporting can be either periodic or aperiodic. In aperiodic CQI reporting, the eNodeB schedules the report on PDCCH, and UE sends the CQI report on PUSCH.

11.5 CQI reporting for Scheduling

The time and frequency resources used by the UE to report CQI are under the control of the eNB. CQI reporting can be either periodic or aperiodic. A UE can be configured to have both periodic and aperiodic reporting at the same time. In case both periodic and aperiodic reporting occurs in the same subframe for a particular CG, only the aperiodic report is transmitted in that subframe.

For efficient support of localized, distributed and MIMO transmissions, E-UTRA supports three types of CQI reporting:

- Wideband type: providing channel quality information of entire system bandwidth of the cell;
- Multi-band type: providing channel quality information of some subset(s) of system bandwidth of the cell;
- MIMO type: open loop or closed loop operation (with or without PMI feedback).

Periodic CQI reporting is defined by the following characteristics:

- When the UE is allocated PUSCH resources in a subframe where a periodic CQI report is configured to be sent, the periodic CQI report is transmitted together with uplink data on the PUSCH. Otherwise, the periodic CQI reports are sent on the PUCCH.

Aperiodic CQI reporting is defined by the following characteristics:

- The report is scheduled by the eNB via the PDCCH;
- Transmitted together with uplink data on PUSCH.

https://www.etsi.org/deliver/etsi_ts/136300_136399/136300/15.08.00_60/ts_136300v150800p.pdf.

7.2.1 Aperiodic CSI Reporting using PUSCH

A UE shall perform aperiodic CSI reporting using the PUSCH in subframe $n+k$ on serving cell c, upon decoding in subframe n either:

- an uplink DCI format, or
- a Random Access Response Grant,

Note: PDCCH with DCI formats used to grant PUSCH transmissions as given by DCI format 0 and DCI format 4 are herein referred to as uplink DCI format when common behaviour is addressed.

https://www.etsi.org/deliver/etsi_ts/136200_136299/136213/15.08.00_60/ts_136213v150800p.pdf.

23. In aperiodic CQI reporting, the eNodeB triggers the CQI report on PDCCH, and UE sends the CQI report on PUSCH. The triggering of the CQI report on PDCCH is carried out by using the Channel State Information (CSI) request bit(s) available in the Downlink control information (DCI) format.

7.2.1 Aperiodic CSI Reporting using PUSCH

A UE shall perform aperiodic CSI reporting using the PUSCH in subframe $n+k$ on serving cell c, upon decoding in subframe n either:

- an uplink DCI format, or
- a Random Access Response Grant,

for serving cell c if the respective CSI request field is set to trigger a report and is not reserved. If the CSI request field is 1 bit [4], a report is triggered for serving cell c if the CSI request field is set to '1'. If the CSI request field size is 2 bits [4], a report is triggered according to the value in Table 7.2.1-1A corresponding to aperiodic CSI reporting.

A UE is not expected to receive more than one aperiodic CSI report request for a given subframe.

Table 7.2.1-1A: CSI Request field for PDCCH with uplink DCI format in UE specific search space

Value of CSI request field	Description
'00'	No aperiodic CSI report is triggered
'01'	Aperiodic CSI report is triggered for serving cell c
'10'	Aperiodic CSI report is triggered for a 1st set of serving cells configured by higher layers
'11'	Aperiodic CSI report is triggered for a 2nd set of serving cells configured by higher layers

Note: PDCCH with DCI formats used to grant PUSCH transmissions as given by DCI format 0 and DCI format 4 are herein referred to as uplink DCI format when common behaviour is addressed.

https://www.etsi.org/deliver/etsi_ts/136200_136299/136213/15.08.00_60/ts_136213v150800p.pdf.

24. The UE is triggered and configured to report the CQI using one of the CSI reporting modes. In UE-selected (sub-band CQI) CSI reporting mode, UE selects the set of M preferred sub-bands of size k within the set of sub-bands S with high CQI (i.e., selecting, based on said quality levels, a set of sub-carriers on which said user data are to be transmitted). The k and M values are a function of system bandwidth.

A UE is semi-statically configured by higher layers to feed back CQI and PMI and corresponding RI on the same PUSCH using one of the following CSI reporting modes given in Table 7.2.1-1 and described below.

Table 7.2.1-1: CQI and PMI Feedback Types for PUSCH CSI reporting Modes

		PMI Feedback Type		
		No PMI	Single PMI	Multiple PMI
PUSCH CQI Feedback Type	Wideband (wideband CQI)			Mode 1-2
	UE Selected (subband CQI)	Mode 2-0		Mode 2-2
	Higher Layer-configured (subband CQI)	Mode 3-0	Mode 3-1	

https://www.etsi.org/deliver/etsi_ts/136200_136299/136213/15.08.00_60/ts_136213v150800p.pdf.

- UE-selected subband feedback
  - Mode 2-0 description:
    - The UE shall select a set of M preferred subbands of size k (where k and M are given in Table 7.2.1-5 for each system bandwidth range) within the set of subbands S.
    - The UE shall also report one CQI value reflecting transmission only over the M selected subbands determined in the previous step. The CQI represents channel quality for the first codeword, even when RI>1.
    - Additionally, the UE shall also report one wideband CQI value which is calculated assuming transmission on set S subbands. The wideband CQI represents channel quality for the first codeword, even when RI>1.
    - For transmission mode 3 the reported CQI values are calculated conditioned on the reported RI. For other transmission modes they are reported conditioned on rank 1.
  - Mode 2-2 description:
    - The UE shall perform joint selection of the set of M preferred subbands of size k within the set of subbands S and a preferred single precoding matrix selected from the codebook subset that is preferred to be used for transmission over the M selected subbands.
    - The UE shall report one CQI value per codeword reflecting transmission only over the selected M preferred subbands and using the same selected single precoding matrix in each of the M subbands.
    - Except for transmission mode 9 with 8 CSI-RS ports configured, the UE shall also report the selected single precoding matrix indicator preferred for the M selected subbands. A UE shall also report the selected single precoding matrix indicator for all set S subbands.

Table 7.2.1-5: Subband Size (*k*) and Number of Subbands (*M*) in S vs. Downlink System Bandwidth

System Bandwidth N_{RB}^{DL}	Subband Size *k* (RBs)	*M*
6 – 7	NA	NA
8 – 10	2	1
11 – 26	2	3
27 – 63	3	5
64 – 110	4	6

https://www.etsi.org/deliver/etsi_ts/136200_136299/136213/15.08.00_60/ts_136213v150800p.pdf.

25. In LTE networks, Channel Quality Indicator (CQI) reports are used to indicate the channel quality information. In CQI reporting, UE measures the quality level of sub-carriers and reports it to eNodeB. The CQI reports can be either periodic or aperiodic.

26. In aperiodic CQI reporting, the eNB triggers the CQI report on PDCCH, and UE sends the CQI report on PUSCH. The triggering of the CQI report on PDCCH is carried out by using the Channel State Information (CSI) request bit(s) available in the DCI format.

7.2.1 Aperiodic CSI Reporting using PUSCH

A UE shall perform aperiodic CSI reporting using the PUSCH in subframe $n+k$ on serving cell c, upon decoding in subframe n either:

- an uplink DCI format, or
- a Random Access Response Grant,

for serving cell c if the respective CSI request field is set to trigger a report and is not reserved. If the CSI request field is 1 bit [4], a report is triggered for serving cell c if the CSI request field is set to '1'. If the CSI request field size is 2 bits [4], a report is triggered according to the value in Table 7.2.1-1A corresponding to aperiodic CSI reporting.

A UE is not expected to receive more than one aperiodic CSI report request for a given subframe.

Table 7.2.1-1A: CSI Request field for PDCCH with uplink DCI format in UE specific search space

Value of CSI request field	Description
'00'	No aperiodic CSI report is triggered
'01'	Aperiodic CSI report is triggered for serving cell c
'10'	Aperiodic CSI report is triggered for a 1st set of serving cells configured by higher layers
'11'	Aperiodic CSI report is triggered for a 2nd set of serving cells configured by higher layers

Note: PDCCH with DCI formats used to grant PUSCH transmissions as given by DCI format 0 and DCI format 4 are herein referred to as uplink DCI format when common behaviour is addressed.

https://www.etsi.org/deliver/etsi_ts/136200_136299/136213/15.08.00_60/ts_136213v150800p.pdf.

27. The UE is triggered and configured to report the CQI using one of the CSI reporting modes (i.e., indication related to a threshold). In UE-selected (sub-band CQI) CSI reporting mode, UE selects the set of M preferred sub-bands of size k within the set of sub-bands S with high CQI. The k and M values are a function of system bandwidth.

28. The eNodeB indicates UE to select 'M' subcarriers with the CSI reporting modes (i.e., With reference to subject patent, CSI reporting modes, Mode 2-0, and Mode 2-2 is the indication from the transmitter to select 'M' subcarriers).

29. Based on the CSI reporting mode (i.e., indication), UE selects the M preferred sub-bands with high CQI (i.e., receiver deduces set of sub-carriers which will be used for transmission of said user data).

A UE is semi-statically configured by higher layers to feed back CQI and PMI and corresponding RI on the same PUSCH using one of the following CSI reporting modes given in Table 7.2.1-1 and described below.

Table 7.2.1-1: CQI and PMI Feedback Types for PUSCH CSI reporting Modes

PUSCH CQI Feedback Type	PMI Feedback Type: No PMI	PMI Feedback Type: Single PMI	PMI Feedback Type: Multiple PMI
Wideband (wideband CQI)			Mode 1-2
UE Selected (subband CQI)	Mode 2-0		Mode 2-2
Higher Layer-configured (subband CQI)	Mode 3-0	Mode 3-1	

https://www.etsi.org/deliver/etsi_ts/136200_136299/136213/15.08.00_60/ts_136213v150800p.pdf.

- UE-selected subband feedback
  - Mode 2-0 description:
    - The UE shall select a set of *M* preferred subbands of size *k* (where *k* and *M* are given in Table 7.2.1-5 for each system bandwidth range) within the set of subbands *S*.
    - The UE shall also report one CQI value reflecting transmission only over the *M* selected subbands determined in the previous step. The CQI represents channel quality for the first codeword, even when RI>1.
    - Additionally, the UE shall also report one wideband CQI value which is calculated assuming transmission on set *S* subbands. The wideband CQI represents channel quality for the first codeword, even when RI>1.
    - For transmission mode 3 the reported CQI values are calculated conditioned on the reported RI. For other transmission modes they are reported conditioned on rank 1.
  - Mode 2-2 description:
    - The UE shall perform joint selection of the set of *M* preferred subbands of size *k* within the set of subbands *S* and a preferred single precoding matrix selected from the codebook subset that is preferred to be used for transmission over the *M* selected subbands.
    - The UE shall report one CQI value per codeword reflecting transmission only over the selected *M* preferred subbands and using the same selected single precoding matrix in each of the *M* subbands.
    - Except for transmission mode 9 with 8 CSI-RS ports configured, the UE shall also report the selected single precoding matrix indicator preferred for the M selected subbands. A UE shall also report the selected single precoding matrix indicator for all set *S* subbands.

Table 7.2.1-5: Subband Size (*k*) and Number of Subbands (*M*) in S vs. Downlink System Bandwidth

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64 – 110	4	6

https://www.etsi.org/deliver/etsi_ts/136200_136299/136213/15.08.00_60/ts_136213v150800p.pdf.

30. In aperiodic CQI reporting, the eNodeB triggers the CQI report on PDCCH, and UE sends the CQI report on PUSCH. The triggering of the CQI report on PDCCH is carried out by using the Channel State Information (CSI) request bit(s) available in the DCI format.

7.2.1 Aperiodic CSI Reporting using PUSCH

A UE shall perform aperiodic CSI reporting using the PUSCH in subframe $n+k$ on serving cell c, upon decoding in subframe n either:

- an uplink DCI format, or
- a Random Access Response Grant,

for serving cell c if the respective CSI request field is set to trigger a report and is not reserved. If the CSI request field is 1 bit [4], a report is triggered for serving cell c if the CSI request field is set to '1'. If the CSI request field size is 2 bits [4], a report is triggered according to the value in Table 7.2.1-1A corresponding to aperiodic CSI reporting.

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Note: PDCCH with DCI formats used to grant PUSCH transmissions as given by DCI format 0 and DCI format 4 are herein referred to as uplink DCI format when common behaviour is addressed.

https://www.etsi.org/deliver/etsi_ts/136200_136299/136213/15.08.00_60/ts_136213v150800p.pdf.

31. The UE is triggered and configured to report the CQI using one of the CSI reporting modes (i.e., indication related to a threshold). In UE-selected (sub-band CQI) CSI reporting mode, UE selects the set of M preferred sub-bands of size k within the set of sub-bands S with high CQI. The k and M values are a function of system bandwidth.

32. The eNodeB indicates UE to select 'M' sub carriers with the CSI reporting modes (i.e., With reference to patent, CSI reporting modes, Mode 2-0, and Mode 2-2, shown in is the indication from the transmitter to select 'M' subcarriers). Based on the reporting mode (i.e., indication), UE selects the M preferred sub-bands with high CQI (i.e., receiver selects set of sub-carriers as a function of said indication related to a threshold and of said quality levels).

A UE is semi-statically configured by higher layers to feed back CQI and PMI and corresponding RI on the same PUSCH using one of the following CSI reporting modes given in Table 7.2.1-1 and described below.

Table 7.2.1-1: CQI and PMI Feedback Types for PUSCH CSI reporting Modes

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PUSCH CQI Feedback Type	Wideband (wideband CQI)			Mode 1-2
	UE Selected (subband CQI)	Mode 2-0		Mode 2-2
	Higher Layer-configured (subband CQI)	Mode 3-0	Mode 3-1	

https://www.etsi.org/deliver/etsi_ts/136200_136299/136213/15.08.00_60/ts_136213v150800p.pdf.

- UE-selected subband feedback
  - Mode 2-0 description:
    - The UE shall select a set of M preferred subbands of size k (where k and M are given in Table 7.2.1-5 for each system bandwidth range) within the set of subbands S.
    - The UE shall also report one CQI value reflecting transmission only over the M selected subbands determined in the previous step. The CQI represents channel quality for the first codeword, even when RI>1.
    - Additionally, the UE shall also report one wideband CQI value which is calculated assuming transmission on set S subbands. The wideband CQI represents channel quality for the first codeword, even when RI>1.
    - For transmission mode 3 the reported CQI values are calculated conditioned on the reported RI. For other transmission modes they are reported conditioned on rank 1.
  - Mode 2-2 description:
    - The UE shall perform joint selection of the set of M preferred subbands of size k within the set of subbands S and a preferred single precoding matrix selected from the codebook subset that is preferred to be used for transmission over the M selected subbands.
    - The UE shall report one CQI value per codeword reflecting transmission only over the selected M preferred subbands and using the same selected single precoding matrix in each of the M subbands.
    - Except for transmission mode 9 with 8 CSI-RS ports configured, the UE shall also report the selected single precoding matrix indicator preferred for the M selected subbands. A UE shall also report the selected single precoding matrix indicator for all set S subbands.

Table 7.2.1-5: Subband Size (*k*) and Number of Subbands (*M*) in S vs. Downlink System Bandwidth

System Bandwidth N_{RB}^{DL}	Subband Size *k* (RBs)	*M*
6 – 7	NA	NA
8 – 10	2	1
11 – 26	2	3
27 – 63	3	5
64 – 110	4	6

https://www.etsi.org/deliver/etsi_ts/136200_136299/136213/10.05.00_60/ts_136213v100500p.pdf

33. In view of preceding paragraphs, each and every element of at least claim 1 of the ’534 Patent is found in the Accused Products.

34. ZTE has and continues to directly infringe at least one claim of the ’534 Patent, literally or under the doctrine of equivalents, by making, using, selling, offering for sale, importing, and/or distributing the Accused Products in the United States, including within this judicial district, without the authority of Brazos.

35. ZTE has received notice and actual or constructive knowledge of the ’534 Patent since at least the date of service of this Complaint.

36. Since at least the date of service of this Complaint, through its actions, ZTE has actively induced product makers, distributors, retailers, and/or end users of the Accused Products to infringe the ’534 Patent throughout the United States, including within this judicial district, by, among other things, advertising and promoting the use of the Accused Products in various websites, including providing and disseminating product descriptions, operating manuals, and other instructions on how to implement and configure the Accused Products. Examples of such advertising, promoting, and/or instructing include the documents at:

- https://www.zte.com.cn/global/about/news/350962.html
- https://www.zteusa.com/products/m2m/zte-me3630
- https://www.zteusa.com/products/all-phones/axon-10-pro.html
- https://www.zte.com.cn/global/about/magazine/zte-technologies/2010/11/en_515/194549
- http://www.zte-deutschland.de/pub/endata/magazine/ztetechnologies/2009year/no11/200912/P020

091222462632602444.pdf

37. Since at least the date of service of this Complaint, through its actions, ZTE has contributed to the infringement of the '534 Patent by having others sell, offer for sale, or use the Accused Products throughout the United States, including within this judicial district, with knowledge that the Accused Products infringe the '534 Patent. The Accused Products are especially made or adapted for infringing the '534 Patent and have no substantial non-infringing use. For example, in view of the preceding paragraphs, the Accused Products contain functionality which is material to at least one claim of the '534 Patent.

JURY DEMAND

Brazos hereby demands a jury on all issues so triable.

REQUEST FOR RELIEF

WHEREFORE, Brazos respectfully requests that the Court:

(A) Enter judgment that ZTE infringes one or more claims of the '534 Patent literally and/or under the doctrine of equivalents;

(B) Enter judgment that ZTE has induced infringement and continues to induce infringement of one or more claims of the '534 Patent;

(C) Enter judgment that ZTE has contributed to and continues to contribute to the infringement of one or more claims of the '534 Patent;

(D) Award Brazos damages, to be paid by ZTE in an amount adequate to compensate Brazos for such damages, together with pre-judgment and post-judgment interest for the infringement by ZTE of the '534 Patent through the date such judgment is entered in accordance with 35 U.S.C. §284, and increase such award by up to three times the amount found or assessed in accordance with 35 U.S.C. §284;

(E) Declare this case exceptional pursuant to 35 U.S.C. §285; and

(F) Award Brazos its costs, disbursements, attorneys' fees, and such further and additional relief as is deemed appropriate by this Court.

Dated: March 31, 2020

Respectfully submitted,

/s/ James L. Etheridge

James L. Etheridge
Texas State Bar No. 24059147
Ryan S. Loveless
Texas State Bar No. 24036997
Travis L. Richins
Texas State Bar No. 24061296
ETHERIDGE LAW GROUP, PLLC
2600 E. Southlake Blvd., Suite 120 / 324
Southlake, Texas 76092
Telephone: (817) 470-7249
Facsimile: (817) 887-5950
Jim@EtheridgeLaw.com
Ryan@EtheridgeLaw.com
Travis@EtheridgeLaw.com

COUNSEL FOR PLAINTIFF